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MCHB-TS-DPH

EXECUTIVE SUMMARY  
EPIDEMIOLOGICAL CONSULTATION NO. 13-HG-06TU-07  
INVESTIGATION OF TWO INTESTINAL BOTULISM CASES  
AT FORT MEADE, MARYLAND  
OCTOBER - DECEMBER 2006

1. **PURPOSE.** The purpose of this epidemiological consultation (EPICON) was to investigate a cluster of *Clostridium botulinum* (*C. botulinum*) in infants at Fort Meade, Maryland. The Kimbrough Ambulatory Care Center Commander at Fort Meade requested assistance from the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) after two infants living on the same street, approximately 116 meters apart, contracted intestinal botulism in October 2006 and December 2006, respectively.
2. **BACKGROUND.** Intestinal botulism, also known as infant botulism, is a rare but serious paralytic illness that almost always occurs in children under 1 year of age. On very rare occasions it can occur in older children and adults after bowel surgery, when people are affected with inflammatory bowel disease, or after antimicrobial therapy (Redbook 2006). Botulism is caused by a nerve toxin released by the bacterium *C. botulinum*, which can be found in soil and dust worldwide. Most cases of botulism affecting children older than 1 year of age and adults occur when spores germinate in improperly prepared foods, producing toxin that affects humans when the contaminated food is eaten. In contrast, cases of intestinal botulism are believed to occur when spores are ingested and are able to germinate within the intestines and produce toxin. It is believed that a permissive environment within the intestines in infants allows the bacteria to grow and produce toxin. In most intestinal botulism cases a source for the ingestion is never identified. In cases of intestinal botulism, toxin and bacteria may be found in stool specimens. Stool specimens collected from both of the Fort Meade infants tested positive for *C. botulinum* toxin type B. Type B toxin-producing *C. botulinum* is prevalent in the eastern United States (U.S.).
3. **METHODS.** The USACHPPM formed an EPICON team for this investigation. The team consulted subject matter experts from the Centers for Disease Control and Prevention (CDC), the California Department of Health Services (CDHS), the Maryland Department of Health and Mental Hygiene (DHMH), and the Anne Arundel County Department of Health. The CDHS was consulted because of its nationally renowned expertise in infant botulism. The team interviewed the affected infants' parents using a modified version of the CDC's infant botulism questionnaire. Stool specimens had been collected by the inpatient pediatric team at the Walter Reed Army Medical Center (WRAMC) and tested by the Maryland DHMH. *C. botulinum* has been isolated from both samples, and isolates will be sent to the CDC for sub typing.

Readiness thru Health

The EPICON personnel conducted town hall meetings with the Fort Meade Garrison Commander to address community concerns. Investigators also provided information sheets to local residents, provided press releases, and conducted media interviews.

#### 4. CONCLUSIONS.

a. Interviews with each family revealed no common exposures that may have been a likely source of the outbreak, and no possible food sources. The risk communication effort was intensified due to the high level of community concern regarding transmission and environmental factors discussed in the interviews, such as nearby construction. This quelled the fears of most Fort Meade residents; however, a local newspaper reported that the parents of one of the affected infants plans to sue the Army, claiming there was negligence in seeking the cause of the two cases. They reportedly believe that dirt from a construction site one block away from the street where both families live is the source of the spores, that soil testing should have been undertaken, and that the Army is intentionally avoiding such sampling because Fort Meade is a Superfund site.

b. Proving or disproving a link with the environment is a dubious task given the lack of previous research in the area. It is widely believed that botulism type B is endemic to the soil in the area and over the entire East Coast of the U.S. Numerous discussions were held with leading *C. botulinum* experts, CDC representatives, and Maryland and Anne Arundel County public health officials about proceeding with environmental testing. The consensus of this group was that environmental testing would not prove or disprove a link between the cases and the environment. In addition, there are no known public health prevention strategies for non-foodborne *C. botulinum*. The Agency for Toxic Substances and Disease Registry does list Fort Meade on the National Priorities List, but their report indicates that the waste sites are far from the current location of the cases. Moreover, while prior dumping sites for waste and dead carcasses are theorized to be a viable source for *C. botulinum*, there has been no evidence to support this.

c. The scientific literature suggests numerous possible modes of ingestion of *C. botulinum* by infants which could be relevant to this investigation, but none of which are proven. The EPICON team could not find a link between the two cases at Fort Meade, other than the residential proximity itself. Much needs to be learned about the epidemiology of infant botulism and the EPICON team reached out to the leading scientists in this field. Possible collaborations for long-term environmental and laboratory research projects were discussed, as each discovered cluster of infections affords a possible opportunity to better elucidate non-foodborne modes of *C. botulinum* transmission.



## 5. RECOMMENDATIONS.

a. Make Military Health System (MHS) providers throughout the National Capital Region (NCR) aware of the two cases at Fort Meade in order to reinforce the need to seriously consider botulism in the differential diagnosis when evaluating infants with paralytic signs or significant constipation and when Sudden Infant Death Syndrome cases are encountered.

b. Reinforce the need for NCR clinic staff to communicate reportable medical events to both civilian and military public health authorities.

c. Encourage referral centers like WRAMC to engage preventive medicine personnel (both its own and those of pertinent installations) early in the course of such events.

d. Enhance Army epidemiologic surveillance for botulism cases.

e. Establish a DOD registry of dependent fatalities.

f. Improve centralized access to military clinical laboratory data.

g. Inform NCR beneficiary parents of newborns and infants about intestinal botulism as part of child health education.

h. Ensure construction contracts serving Fort Meade and other installations require control measures to minimize dispersion of fugitive dust.

i. Continue risk communication efforts on a scaled-down basis, monitor media coverage, and remain ready to respond to community rumors, misunderstandings and misperceptions in a timely manner.